



*U.S. Army Space and Missile Defense Command/
Army Forces Strategic Command*



Maintaining Infrastructure through Green Solutions in The Republic of the Marshall Islands (RMI)



"Secure the High Ground"

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE JUN 2010		2. REPORT TYPE		3. DATES COVERED 00-00-2010 to 00-00-2010	
4. TITLE AND SUBTITLE Maintaining Infrastructure through Green Solutions in The Republic of the Marshall Islands (RMI)				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) U.S. Army Space & Missile Defense Command/ Army Forces Strategic Comd,P.O. Box 1500,Huntsville,AL,35807-3801				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES Presented at the NDIA Environment, Energy Security & Sustainability (E2S2) Symposium & Exhibition held 14-17 June 2010 in Denver, CO.					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 12	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

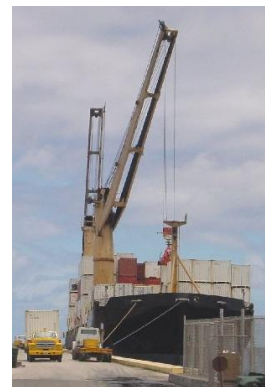


Topics to Cover

- **Corrosive island environment, isolation, age**
- **About Kwajalein**
- **Electric Vehicles/Solar Panels**
- **Power Reduction/Energy Conservation**
- **Waste Oil Solution**



Kwajalein, Marshall Islands





The Challenges ...

Balancing Mission, Infrastructure
and Quality of Life

Retaining Our Uniquely - Skilled
Workforce

A 21st Century Mission, with 1950's -
60's Facilities



Spalling Concrete
hazards



Aging/Failing
Facilities

Piers Restricted





Electric Vehicle Initiative

- To replace fossil fuel vehicles with electric vehicles
 - Provide smaller and more efficient work vehicles
 - Reduce maintenance & corrosion repairs
- To reduce energy costs and increase battery life
 - Utilize solar panel roof on electric carts
 - Reduce maintenance repairs
 - Reduce out of service down time
- Positive GREEN Initiatives





Brainstorming Matrix for Power Reduction Improvements

Eliminate
trailer
homes

Appoint
Energy
Managers

Institute Fee
Structure for
personal
facilities

Power	Description	Ranking
High	High kW saved	10
Medium	Medium kW saved	5
Low	Low kW saved	1
Ease	Description	Ranking
Go Do It	Does not impact labor or current scope of work; "No" cost	10
Easy	Needs KRS management approval for allocation of time for effort; little cost	8
Moderate	Needs funding, multiple resources, and USAKA approval	6
Hard	Funding needed and letter of direction required (from SMDC) to implement	2
Investment	Cost	Ranking
No Cost	\$0 (within PWS)	10
Low	<\$10K	8
Moderate	>\$10K and <\$50K	6
High	>\$50K and <\$100K	3
Very High	>\$100K	1
Risk	Description	Ranking
No Risk	No Risk	10
Low	Low Consequence and Low Likelihood	8
Medium	Medium Consequence and Medium Likelihood	4
High	High Consequence and High Likelihood	1
PWS	# of Changes	Ranking
Go Do It	No Change	10
Low	Quick Change	8
Medium	Multiple Changes	4
High	Complete Revision	1
Time	Description	Ranking
Go Do It	Implementation started in <90 days	10
Fast	Implementation started in >90 days and <1 year	5
Medium	Implementation started in > 1 year	1

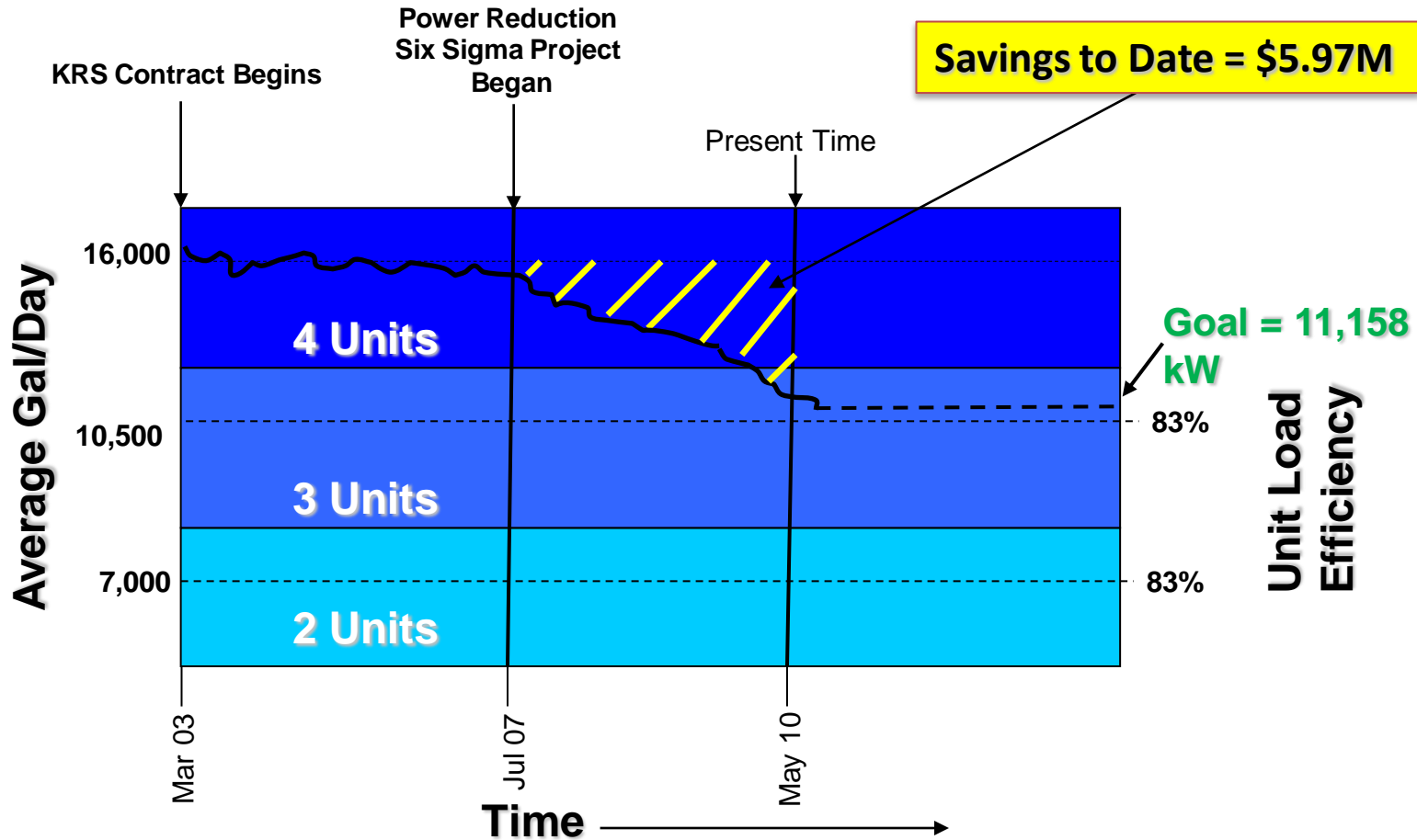
Consolidate
Footprint

Set Points
Raised to
74°

Minimize
appliances



Kwajalein Power Plant fuel consumption (gal/day)



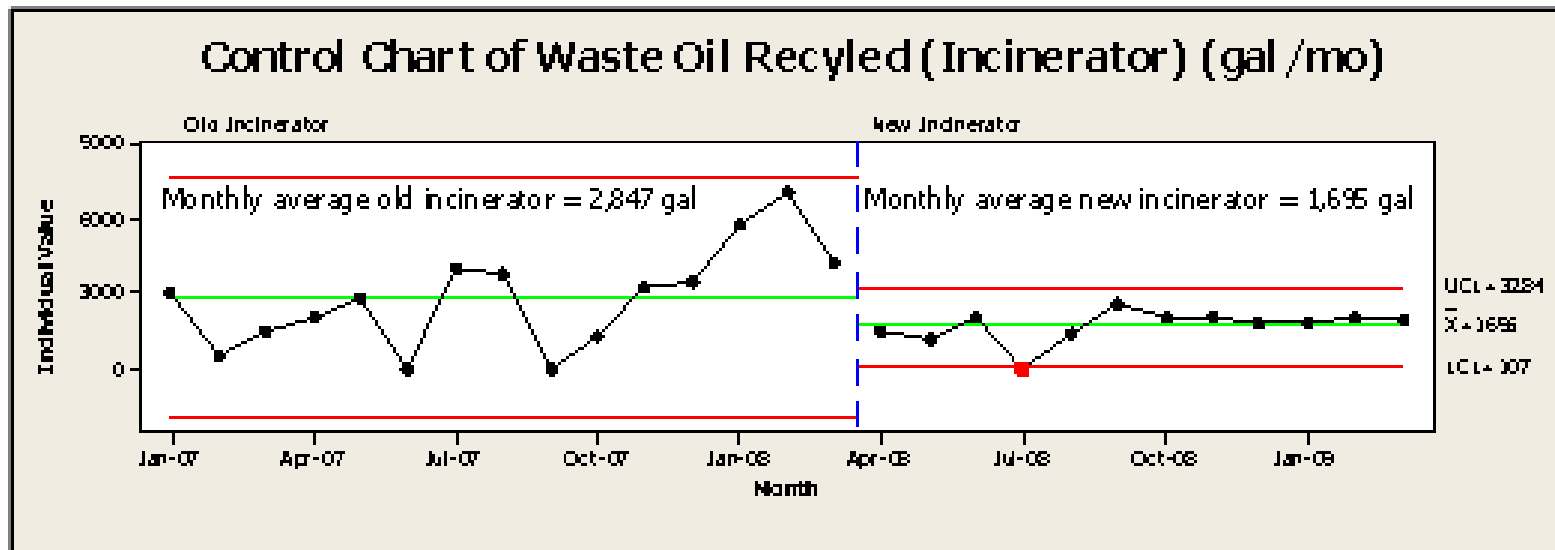
Saving Power through Six Sigma



Reduce, Reuse, Recycle of Waste Oil

How it Started:

The baseline performance for January 2007 through March 2008 showed that KRS generated a monthly average of 3,773 gallons of waste oil. In March 2008, a new, more energy-efficient incinerator replaced the older one. However, the old incinerator helped reduce waste oil backlog by burning more (2,847) gallons per month, whereas the new incinerator that burns 1,695 gallons per month creates greater backlog, leading to more waste oil overtime.





Planned Approach

Objective

The objective of this PIP is to improve waste oil management by focusing on three key areas.

1

Reduce amount of
Oil product used

2

Reduce generation of
used petroleum product
through reuse or
recycling

3

Reduce off-island
disposal for excess and
backlog of used
petroleum product

1

Procure and
use oil product

Recycle at
point of
generation?

No

2

Generate
waste oil

Recycle at
incinerator?

No

3

Dispose off-
island

Yes

Used oil
recycled as
fuel

Yes

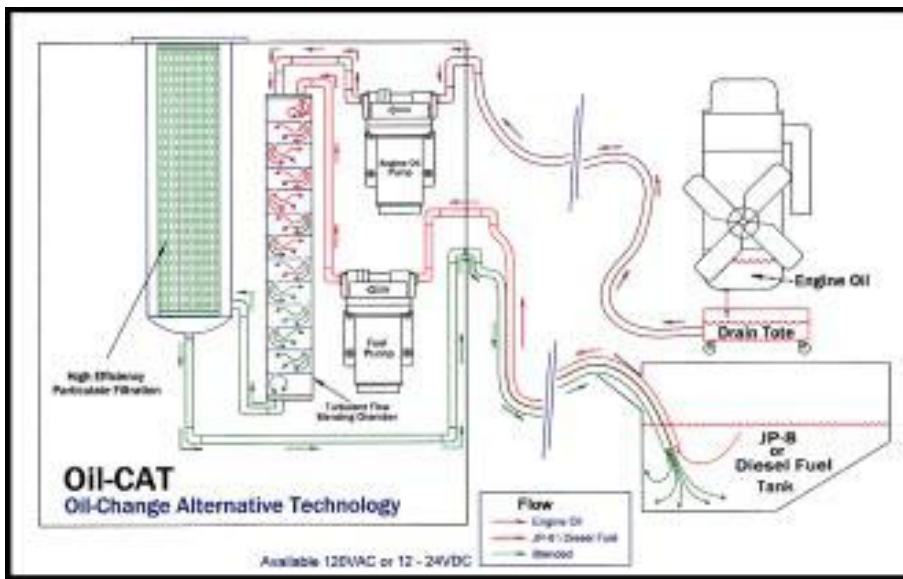
Used oil
recycled as
fuel



Example of an Improvement

Improvement #1: Waste Oil Filtration and Blending Units

- Purchase filtration/blending units (Payback in <1 month/unit)
- Filters oil to be reused in same equipment as fuel
- Automotive & Power Plant
- Will reduce backlog by 1,406 gal/month





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Oil Cat Improvement



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Projected excess waste volumes with or without improvements

